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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,799	02/10/2004	Mark Gurvich	PWV1.PAU.53	9672

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EXAMINER

NGUYEN, KHANH V

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/775,799	GURVICH ET AL.	
	Examiner	Art Unit	
	Khanh V. Nguyen	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 10-40 is/are rejected.
- 7) ☒ Claim(s) 7-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Mueck (5,977,825).

Regarding claims 1, 33, Mueck (Fig. 1) discloses a feedforward amplifier comprising: an input (e1); a main amplifier (V1); a main amplifier output sampling coupler (K2); a first delay (L1); a coupler (K4) is functional equivalent of carrier cancellation combiner since it receives two signals (a12 and e12) and produces an output signal (f1); an error amplifier (V3); a second delay (L3); a coupler (K6) can be read as an error coupler; a coupler (K7) can be read as an output sampling coupler; a delay (L2) to coupler (K9) can be read a carrier signal reduction circuit; and blocks (ST2, SD, MX and LO) can be read as a detector comprising a frequency down converter (MX, LO) and a controller (ST2) which is functional equivalent of a digital signal processor having the functions thereof.

Regarding claim 34, Mueck discloses gain and phase (D2, P2) coupled to error amplifier (V3) and controlled by control (ST2).

Regarding claim 35, Mueck discloses gain and phase (D3, P3) coupled to error amplifier (V3) and controlled by control (ST2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 10-12, 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueck.

Regarding claim 3, Mueck (Fig. 1) discloses the claimed invention except an inherent third delay that is bigger than the second delay. Since the third delay is inherent in the error signal path, one of ordinary skill in the art would realize that Mueck might also has an inherent delay as claimed. Regarding third delay that is bigger than the second delay, one of ordinary skill in the art might select a third delay that is bigger

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than the second delay, since they are based on the routine experimentation to obtain the optimum operation in a feedforward circuit.

Regarding claims 10-12, wherein the characteristics in the recited claims can be obtained by changing the size of the components in a circuit. A change in size is generally recognized as being within the level of ordinary skill in the art to provide optimum performance in a feedforward circuit.

Regarding claims 36-40, wherein the characteristics in the recited claims can be obtained by changing the size of the components in a circuit. A change in size is generally recognized as being within the level of ordinary skill in the art to provide optimum performance in a feedforward circuit.

Claims 2, 4-6, 13-15, 16-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueck in view of Gentzler et al. (6,118,339).

Regarding claims 2, 4, 5, 13-16, 28-31, Mueck discloses the claimed invention except claimed controller. Mueck (Fig. 1) discloses a feedforward amplifier comprising: an input (e1) for receiving an RF input signal; a first control loop coupled to the input and comprising a main amplifier (V1), a main amplifier output sampling coupler (K2), a delay element (L1), and a coupler (K4) is functional equivalent of a first carrier cancellation combiner, a signal path receiving the output of the main amplifier (V1), a second signal path comprising an error amplifier (V3) receiving the output of the first carrier cancellation combiner (K4), and an second control loop coupled to the first control loop and comprising a first error injection coupler (K6) coupling the first and

second signal paths, said first and second signal paths having a delay mismatch with said first signal path having substantially less delay than said second signal path; an output via coupler (K7) coupled to the error injection coupler, a third control loop coupled between the input (e1) and the output and comprising a first coupler (K3) for sampling the input, a second coupler (K7) for sampling the output, and a coupler (K9) is functional equivalent of a second carrier cancellation combiner, a distortion detector coupled to the output of the second carrier cancellation combiner, said distortion detector comprising a controller (ST2) which is functional equivalent of a digital signal processor performing a signal analysis on the output of the second carrier cancellation combiner (K9), and a controller, coupled to the distortion detector, for controlling at least one of the first and second control loops to minimize distortion detected by the distortion detector.

Gentzler et al. (Fig. 20) also disclose a feedforward amplifier having a control system (104) comprises a controller (122) for iteratively adjusting, a DSP (122), A/D (120), bandpass filter (108), and down converter (106, 126).

Accordingly, it would have been obvious in view of the reference, taken as a whole, to have modified a control (ST2) of Mueck to have included a controller as taught by Gentzler et al. Such a modification would have imparted the advantageous benefit of reducing distortion and providing adjusted frequency as taught by Gentzler et al, to Mueck's reference, thereby suggesting the obviousness of such a modification.

Regarding claim 6, wherein Gentzler discloses a predistorter (105) coupled to a main amplifier and is controlled by controller (124) to minimize distortion.

Regarding claims 17-20, wherein the delay mismatch is depending on the selected value(s) of the delays in the reference circuit.

Regarding claim 21, wherein Mueck discloses a delay (L2) and gain/phase (P3, D3).

Regarding claim 22, control (ST2) controls gain and phase (P3, D3).

Regarding claims 10-12, 32, wherein the characteristics in the recited claims can be obtained by changing the size of the components in a circuit. A change in size is generally recognized as being within the level of ordinary skill in the art to provide optimum performance in a feedforward circuit.

Allowable Subject Matter

Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-9 call for, among others, wherein said carrier signal reduction circuit further comprises an input sampling coupler (310) configured between the first delay (115) and the carrier cancellation combiner (315) for sampling the input RF signal and a second carrier cancellation combiner (260) for combining the sampled output signal (235) and the sampled input signal (310) to cancel a carrier component in said sampled output signal.

Conclusion

Applicant's amendment (filed **March 24, 2005**) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



KHANH V. NGUYEN
PRIMARY EXAMINER